

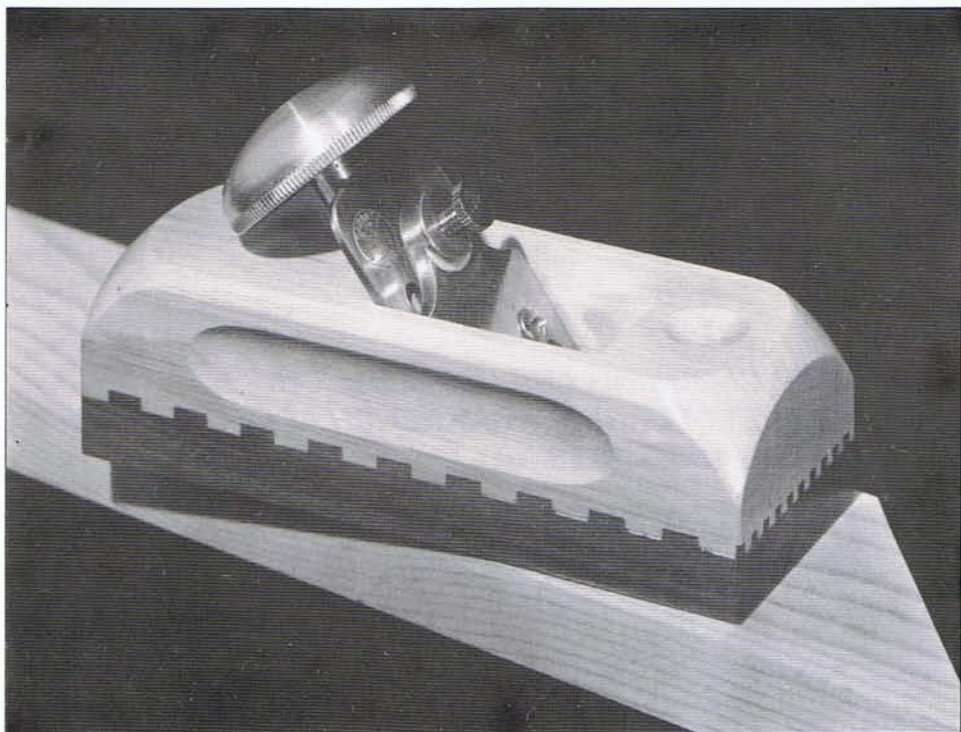


E.C. Emmerich's

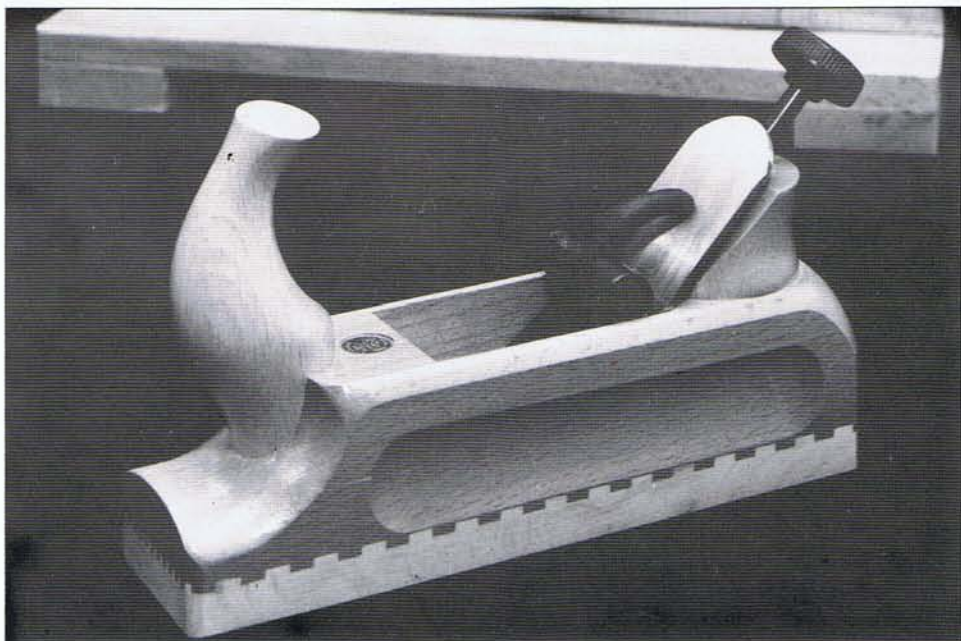
Complete Book Of Woodworking Tools

**A GUIDE TO CHOOSING AND USING BENCH AND
SPECIALTY PLANES, CUSTOM WORKBENCH
ACCESSORIES, AND OTHER HAND TOOLS**





Pocket Plane -- 649-P (See Page 15)



Expert Jack Plane -- 605 (See Page 15)



English Pattern Jack Plane -- 741-P (See Page 14)

State-Of-The-Art Wooden Bench and Specialty Planes

Among all hand woodworking tools, planes are by far the most diversified and, consequently, among the most useful for expert woodworking. They are the first category of hand woodworking tools we will consider.

Before choosing a plane, consider your personal likes. If you love the look and feel of fine wood, if you like its strength, its durability, its light weight, its texture, warmth, color, beauty, then you really want to use a wood plane.

A wood plane, from which cast iron planes were copied, remains the ultimate in the plane maker's art. A light weight wood plane is a delight to handle and use. With the Primus adjustment, it is a precision tool, capable of cutting so smoothly that work is near ready for finishing, cutting so delicately

that shavings can be translucent, measurable only with a micrometer.

To select planes wisely, and to use them skillfully, you should understand the design objectives and the various capabilities. They are described later.

Following, most E.C.E. bench planes are discussed, from Primus, Expert, and Pocket, with their patented adjustment systems, to a wide array of specialty planes. There are tips on using planes correctly.

At the back of this section, are ways to care for planes so they will last your lifetime and even longer. Finally, workbench accessories for planes, marking tools, chisels, and mallets are shown and described.

How Planes Work

Specific design elements in a plane enable it to perform. There are three basic elements in a plane: Body, Handles, and Cutter. Here's how each element works.

BODY/SOLE

Mouth

Small mouth reduces tear outs. Distance of toe from the cutting edge controls course or fine feed. Keep mouth opening relative to thickness of shaving. Adjustable toe varies size of mouth opening on 711 smoothing, 710 and 710-P rabbet planes.

Length of Sole.

Long sole levels out high and low areas.

Shape of Sole.

Matches shape of cutter, straight, round or compound curve.

HANDLES/BODY

Front

Adds control and leverage. A front horn is preferred grip on Continental planes because it allows user to control with both hands.

Rear

A low handle, integral with the body, provides the best control and leverage. On most wood-bodied planes, the rear handle can be low. On metal planes it must be higher.

CUTTER

Single Iron

Used on inexpensive planes, or where back iron is impractical, in which case the pitch must be higher.

Double Iron (Secondary Chip Breaker).

Top curling iron (supplementing toe) causes shaving to minutely break and curl upward so they do not cause splintering or tearouts. Double iron also minimizes blade chatter.

Spur Cutter in Front of Iron

When rabbeting across grain, knife edge of spur slices fibers so cutting iron does not tear adjacent fibers.

Skewed Iron

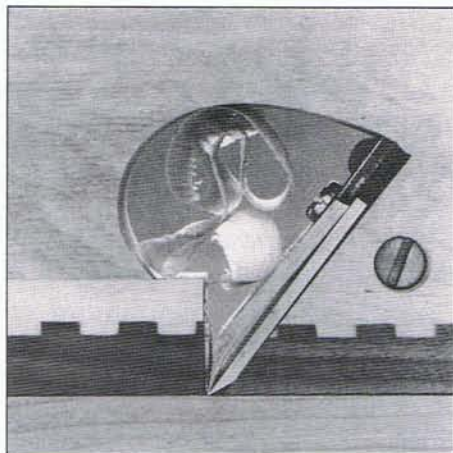
Iron bedded in body at an angle facilitates slicing action when planing across grain. This reduces tearouts.

Shape of cutting edge.

Ground straight for smoothing and rabbet planes, slightly curved for jack, and major convex for scrub planes. Convex cutting edge permits thicker shavings for faster wood removal.

Pitch of Cutter

The angle at which the cutter is bedded allows a plane to perform the different tasks described at right.



Closeup of the cutting area of a rabbet plane clearly shows how its small mouth, with adjustable toe close to cutting edge, plus top iron curling the shaving, precludes tear outs.



Primus (711) smoothing plane has adjustable toe so mouth opening and depth of cut can work together to minimize tear outs.

NAME OF PITCH	DEGREES OF ANGLE	CUTTING TASK	E.C.E. PLANE
COMMON	45	Surface soft woods Curvilinear cuts on all woods	Standard
YORK	50	Surface hardwoods Edge soft woods	Smoothing, English Pattern Jack, Pocket, Rabbet
HALF	70	Surface difficult hardwoods and tooothing surfaces for veneers	Tooothing

Woods E.C.E. Uses

Many people find beauty and pleasure in wood. Despite the cheapness of metal and plastics, more wood is being used today than ever before. For woodsmiths, it's fascinating to learn the inherent mechanical properties and the special features in a species that suit it to a specific need. Selection of woods for unique purposes has evolved over many centuries. Modern wood technology explains the scientific basis for

those early, pragmatic choices our forebears made.

From several hundred varieties of wood now available commercially, four were selected by Emmerich for their planes and workbench accessories: beech, fruitwood, hornbeam, and lignum vitae. For certain marking tools, rosewood was added. Characteristics of these woods reveal other aspects of E.C.E. tool quality.



European Beech is unequalled in value for plane bodies.

EUROPEAN BEECH

Huge beech trees are readily available throughout central Europe and England. Beech is hard and strong, but lighter than its relative oak. Tool makers found this to be a useful material for workbenches early on. Steaming turns the wood pale, pink-brown. The heartwood has high crushing strength and medium resistance to shock loads. Quarter-sawn surfaces reveal conspicuous brownish wood rays. They appear to be of different heights along the grain.

Once it's well seasoned, beech remains very stable, enabling woodworking planes to remain accurate. Because of its stability, it's used as a base for fine veneering.

EUROPEAN HORNBEAM

This medium size tree averages 20 to 24 inches in diameter. Heartwood is white with an occasional grayish streak. Hornbeam shows a flecked figure on quarter sawn surfaces due to broad rays. It has a fine, uniform texture about the weight of oak. It resembles holly and is one of the hardest woods growing in Europe. Because of the texture and hardness, it is considered superior to beech. Hornbeam is a difficult wood to work, but takes a fine finish. It is a favorite wood for wooden bench screws, tool handles, and mal-

The tree has uniform spring and summer growth producing an even grain that lacks both large pores and large rays. Pores are fine and evenly spread throughout. Because beech doesn't have a pronounced grain, its smooth even surface resists wear making it ideal for planes where body and sole are one, such as E.C.E. router and plow planes. Easy on the hands, it is also used for tool handles, screwdrivers, mallets, brush handles, and musical instruments.

After 145 years, abundant European beech remains a mainstay for Emmerich bench and specialty plane bodies.

lets, where great crushing strength is required. It resists splitting and defies wear.

It is also used for billiard cues, drum sticks, pulleys, skittles, piano hammers, etc.

E. C. Emmerich uses hornbeam for chisel handles and marking gauges. Emmerich adapted this wood for plane soles. In use, hornbeam polishes to produce a very glossy surface that glides over the work piece. Pushing effort focuses on the cutting action.

LIGNUM VITAE

Native to the West Indies, South America and Central America, it is one of the hardest, heaviest, closest-grained woods known. Double the weight of Walnut, only slightly lighter than iron, lignum vitae growth rings are indistinct. The grain is heavily interlocked. That means the wood fibers grow first in a left- and then in a right-handed spiral, and then alternate the spiral direction

every few years. The wood texture is fine and uniform and contains guaiac resin that makes it oily.

Lignum vitae has the ability to withstand working pressure of 2,000 lbs. per square inch. Lignum vitae self-lubricating bearings are used in clocks, dishwashing machines, and underwater marine equipment. It is used as rollers for awnings, thrust

blocks for propeller shafts, plus guides for band saw blades, and washers for rotating sprinklers, wheels and casters.

Great stability, extreme resistance to wear, and self-lubrication makes this exotic species E.C.E.'s choice for their best plane soles. The high resin content runs 25 to 30 percent of its weight. In use, this natural gum polishes the

sole to a slick finish that slips easily across work surfaces. Metal plane soles, which are corrugated by manufacturers and then waxed by users to reduce friction, fall short of *lignum vitae* soles ease of use.

Dark olive brown, typically with darker yellow-green streaks, handsomely accents lighter colored wood bodies.

CHERRY WOOD

Varieties of cherries thrive in gardens, orchards, and forests worldwide. Some are ornamental, others bear crops, a few provide timber. American wild cherry is a large forest tree found mixed with other hardwoods such as walnut, oak, and hickory. It grows abundantly in the Appalachian Mountains. Colonists called it New England mahogany.

Heartwood has a fine, straight, close grain with smooth texture. Reddish-brown, freshly cut cherry is readily dis-

tinguished from other brownish woods by its golden sheen, often carrying a hint of green. With age, it darkens to a rich red mahogany shade.

Cherry is hard, yet relatively light weight. After seasoning, it is comparatively free from checking or warping. This timber is used for fine furniture, carvings, pattern making, picture frames, and other high grade joinery. E.C.E. reserves this fruitwood for its finest Improved Primus Smoothing plane body.

ROSEWOOD

Rosewood contains oil that makes it resistant to the effects of moisture. The texture is uniform and moderately coarse. The raw wood surface is dull.

Rosewood has the unusual quality of the grain not shrinking either way and retaining exact measurements. The grain is narrowly interlocked producing

a ribbon grain figure. It is two-thirds the weight of *lignum vitae*.

Since it is remarkably stable dimensionally, it's the classic of choicest woods for try and bevel square handles. Heavy oil within the wood makes possible high-luster finishes that contrast beautifully with brass.

CHARACTERISTICS OF QUARTER SAWN WOOD

After careful selection of species, woods are quarter sawn, and painstakingly cured. Tight joinery and appropriate finish contribute to tool stability.

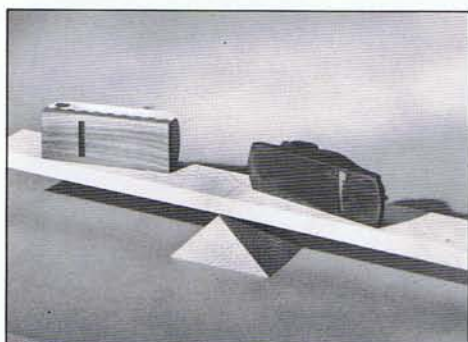
Cut is made 90 degrees to the growth rings but parallel to the rays. (See *opposite page*.) To achieve this, log is

first sawn into quarter sections. Next radial cuts are made approximately parallel to the rays which radiate from the heart like wheel spokes. This produces a striped figure with lace pattern. Wood so cut moves least with changes in atmospheric moisture.

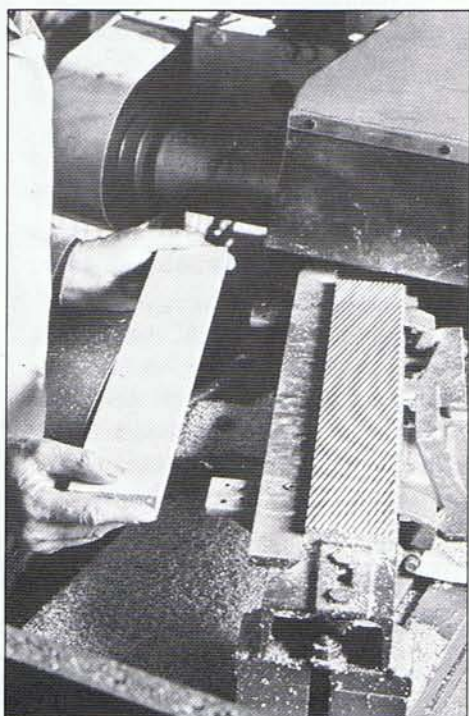
E.C.E. Plane Facts



Modern techniques are used to scientifically cure the quarter-sawn cantlins.



Weighty iron hinders planing wood, rather than helps. Shearing a wood surface is a function of guiding a razor-sharp, properly adjusted iron held in a stable holder across the surface.



Precision cut, castellated glue joint of sole to body insures no twist, no warp. Finally, varnished surface minimizes moisture absorption to further enhance stability.

E.C.E. Primus Planes

Primus bench planes, products of legendary German craftsmanship, offer numerous advantages not found in other wood planes and certainly not in cast iron planes. Among them are.

Exclusive, patented system to regulate depth of cut.

- Anti-backlash control of cutting iron eliminates annoying freewheeling when adjusting depth of cut. Primus adjustment has the tight feel of rack and pinion steering in fine automobiles.
- With the adjusting screw, you can control the depth of cut *positively* with micro-precision. The adjustment system pulls the heavy gauge cutting iron tightly back against the throat of the plane by means of a tensioning spring. The entire plane body is made taut, preventing chatter and vibration.

Superior cutting blade holds an edge longer than any other.

The cutting iron is thick, rust-resistant German chrome vanadium steel, hardened to Rockwell C-62. This high speed tool steel quality is typical of metal lathe cutting tools.

- Before leaving the modern factory, each blade is carefully sharpened.

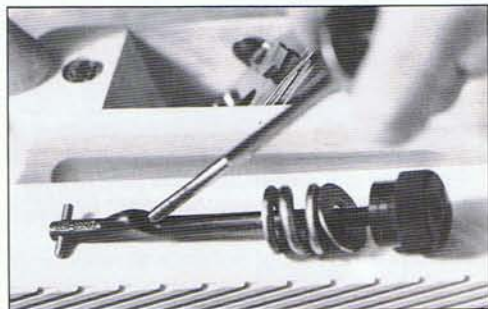
Then it is adjusted and tested in the plane body to assure perfection.

Plane body designed by experts and shaped to fit the hands comfortably.

- The body is made from select, quarter-sawn hardwood. Cantlins are seasoned slowly to stabilize it against warping or twisting.
- Wood soles are made from special varieties of wood that are wear resistant and which glaze over to become slick in wood-to-wood contact use.
- Body and one-half-inch-thick sole are bonded in a uniquely machined glue joint that further stabilizes the assembly.
- Ergonomically correct thrust leverage is provided by a continental style front horn and rounded rear support. It is easy arm and wrist action pushing the light weight plane that makes the cut. Inertia from weight of heavy cast iron does not assist the cut.

PRIMUS ADJUSTMENT SYSTEM

Eighty-seven years after the Bailey depth adjustment was first marketed, E.C.E. patented this non-free wheeling, positive adjustment. No longer do craftsmen have to resign themselves to frustrating trial-and-error adjustments.



Jack Plane -- 703/703-P

White hornbeam body 9-1/2 inches long with contrasting brown lignum vitae sole (703-P) or beech body and hornbeam sole (703). The 1-7/8 inch wide blade is bedded at common pitch (45°) for general work. Use this plane for cleaning off saw or planer ripple marks and squaring stock. Designed for all around use, the jack should be your first plane investment. A spare jack plane blade makes sense for heavy duty work, such as cleaning rough sawn boards and glued-up stock. It saves your carefully honed plane blade edge for finer work.



Primus Jack Plane -- 703-P

Primus Smooth Plane -- 704/704-P

Beech body 8-7/8 inches long with either hornbeam sole (704) or lignum vitae sole (704-P). Reserve this splendid plane for those final strokes on your shop work. The 1-7/8 inch wide blade is bedded at York Pitch (50°). The steeper blade angle minimizes tear outs. When properly honed and adjusted, it cuts tissue-thin, ribbon like shavings, producing surfaces that are a scrape away from finishing.



Primus Smooth Plane -- 704

Primus Rabbet Plane -- 710/710-P

White hornbeam body has a contrasting brown lignum vitae sole (710-P) or hornbeam body and sole (710). Use to cut square shoulders with the grain on edge of boards. The rabbet joint has many woodworking applications. To reduce tear outs, the 1-1/8-inch wide double iron is bedded at a steep 50° angle, making it an important woodworker's hand tool. E.C.E. has fashioned it with their patented Primus adjustment to set the blade quickly and positively. The mouth is also adjustable. An 11-inch length makes this plane especially



Primus Rabbet Plane -- 710-P

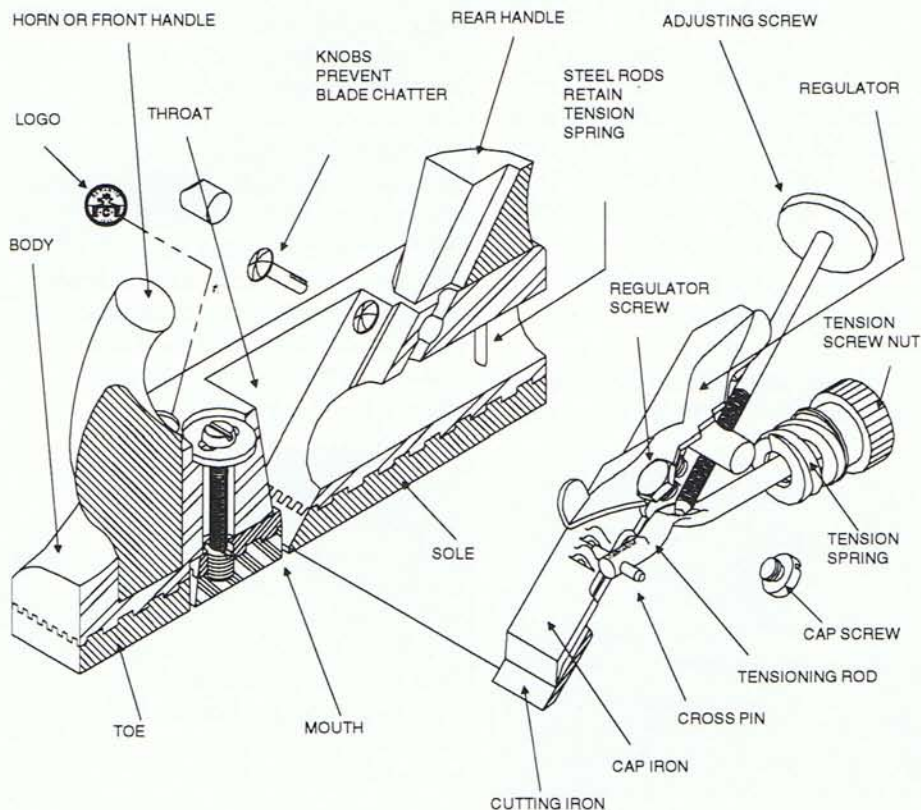
suitable for working long, through rabbets in hardwoods.

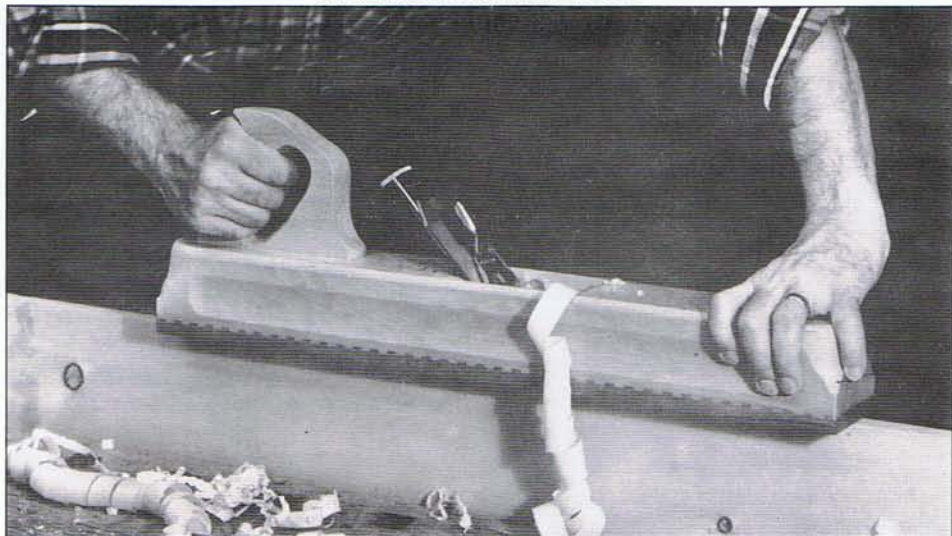
Improved Primus Smooth Plane-711

This is the ultimate in a fine finishing plane. It is the same as 704 above, except for its handsome fruitwood body and adjustable toe, which is secured by a screw head on top. That part of the plane sole immediately in front of the blade acts as the primary chip breaker. The smaller the mouth, or the closer the toe is to the cutter, the more effective the chip breaker. So, reducing the mouth opening relative to the depth of cut minimizes tearing the grain. To produce the smoothest surface when using any bench plane, determine the grain direction by looking at the side of the board; then test plane with the grain.



Improved Primus Smooth Plane -- 711





Primus Try Plane -- 701-P

Primus Try Plane - 701/701-P

The try plane features a beechwood body with either hornbeam sole (701) or lignum vitae sole (701-P). It is also known as a jointer plane because its two-foot long sole and 2-3/8-in. wide blade make it especially suited for leveling hills and valleys on a long edge or warp and twist on a wide surface. The wide blade will trim in one cut a 1-1/4-in. thick commercial wood door.

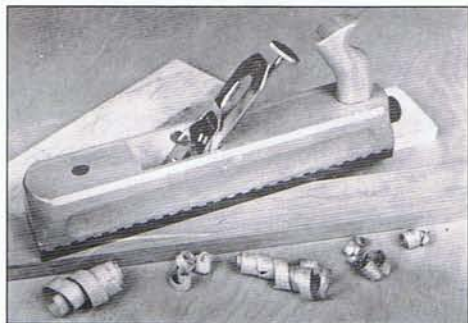
To prepare an edge for gluing, use a jack plane to remove the roughness, then use a try plane to produce a smooth, even edge. When thicknessing wide boards, use the try plane after

a jack plane, but before a smooth plane.

When using any bench plane, begin each stroke by pressing down slightly on the front of the plane. End each stroke by pressing down on the back of the plane. This technique counteracts the natural tendency to round the front and rear board ends. To test for straightness, tilt the plane body so only a long edge is touching the work and look for slivers of light which indicate valleys. Long shavings mean that your plane is correctly sharpened and adjusted and that you are taking a cut along a trued edge.

English Pattern Jack Plane -- 741-P

This Primus jack plane is longer than the continental European version. It's 15-1/2-in. long body makes the tool useful as a short try plane. The 1-7/8-in. wide blade is bedded at 50° to minimize tear outs in hardwoods. Use it to clean those ripple marks left by rotary cutting portable and stationary electric power tools. Beech body with lignum vitae sole.



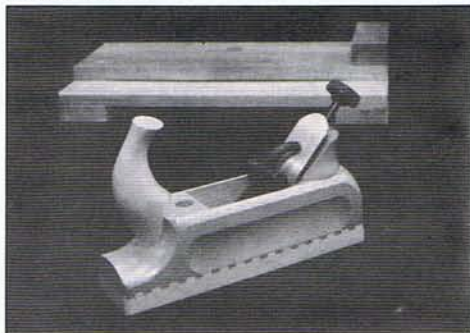
English Pattern Jack Plane -- 741-P

Expert -- 605

Priced between Primus and wedged planes, this jack plane has all the advantages and ease of working of a quality wood plane at an economical price. It's the workhorse in the workshop. Blade is bedded at 45° .

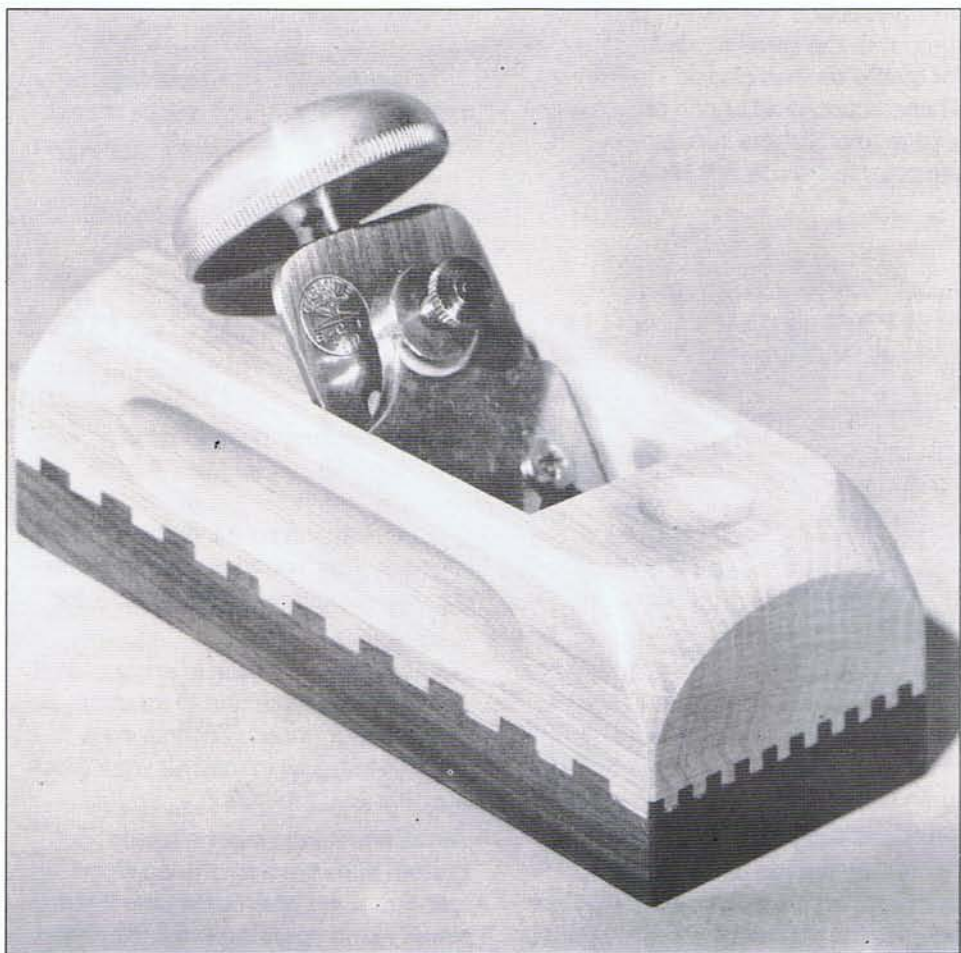
Adjustable Block Plane -- 649-P

The 649-P "Pocket Plane" has our exclusive adjustment control to set the iron for precision cuts. The blade is 1-1/2 in. wide and bedded at 50° . With hornbeam body and lignum vitae sole, this handsome, light-weight plane is easy to tote in a pocket for small plan-



Expert -- 605

ing jobs. It also does well at trimming end grain. And the body won't crack if dropped or rust if kept in a garage.



Adjustable Block Plane -- 649-P

E.C.E. Wedged Bench Planes

E.C.E.'s wedged bench planes are fitted with an integral steel wedge support. This modern wedge design allows:

- Free flow of shavings.
- Hand loosening of wedge.
- Exceptionally stable cutting iron.

Chatter-free cutting iron results from a rigid, hardened steel fulcrum that does not pierce the plane body and thereby weaken it.

Wedged E.C.E. planes are manufactured with the same materials and care for quality as their classic forerunners. These economical bench planes use a wedge to adjust the iron, rather than the patented screw adjustment sys-

tems found in the newer Primus, Pocket, and Expert models.

Setting the wedge requires a few taps with a mallet. Hold the blade about 1/8-inch up from the sole, then tap the wedge snug. Tap the top of the blade for depth and sides for lateral adjustment.

Double Iron wedged bench planes include the Improved Smooth Plane -- 111-S, Try Plane -- 101-S and 101-SP, Jack Plane -- 103-S, Smooth Plane -- 104-S, and German Jack Plane single iron 105-S.

Tips for Using Bench Planes

There are several things to know about using any bench plane. Caution and care are key words.

Before starting, check blade depth adjustment. Hold plane upside down, and sight down the sole against a light. Start with a fine cut.

Next, study the grain direction in the work piece. Run your fingers over the surface, first one way, then the other to get a clue. Also note the direction of grain lines on the edge. Finally, take some test cuts.

Plane with the run of the grain, not against it, so it doesn't tear. It may not be possible to plane the entire board in one direction because grain may

change direction on a long board. Test with fine cuts. You may have to plane from each end toward the middle, for example.

Occasionally wild grain is encountered. The beauty is worth the extra effort. Be sure blade is honed. Try finer cuts, plane diagonally, maneuver work piece to shave with the grain.

You cannot always get a totally smooth surface. Sometimes wood splinters even when using the finest plane. Hand scraping will finish that area.

Scrub Plane -- 106-S

Scrub or roughing plane has a 9-1/2-inch long beech body and hornbeam sole. A simple convex iron,

ground to at 45°, is fixed with a wedge. Use this handy plane to remove excess wood rapidly. Cut with or diagonally to the grain.



Scrub Plane -- 106-S



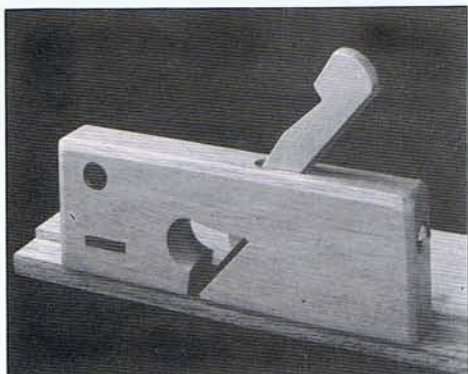
Working with the Scrub Plane -- 106-S

Specialty Planes

There are many planes designed for special purpose cuts. These either supplement or supplant a range of power tools and provide valuable workshop versatility inexpensively.

Rabbet Plane -- 9-S

This fine wedged plane has a hornbeam body. Single iron is available in eight widths from 1/2-inch to 1-1/4 inches. Its 9-1/2-inch long body assures an evenly cut rabbet.



Rabbet Plane -- 9-S

Stop Rabbet Plane (Chisel Plane) -- 58-S

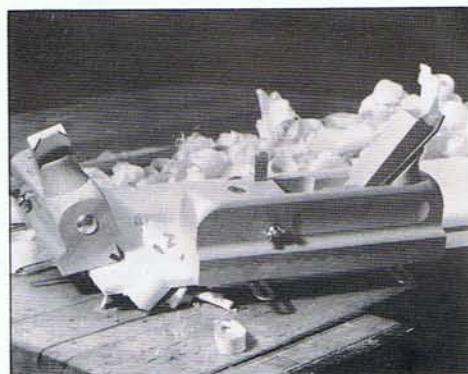
Hornbeam body 7 inches long. Gives good control in paring the last few inches of a stopped rabbet cut with the grain. The 1-1/4-inch wide blade is mounted on front of body and is bedded at the steep York pitch (50°) to reduce tear outs. Set blade to take fine cuts. In use, bear down on the back two-thirds of the body.



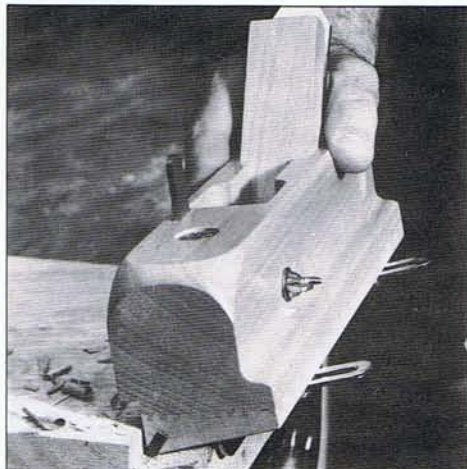
Stop Rabbet Plane (Chisel Plane) -- 58-S

Moving Fillister Plane -- 48-S

Beechwood body 9-1/2 inches long with hornbeam sole. The 1-1/4-inch wide blade is bedded at 45°. Plane has adjustable fence, depth stop, and knife spur to slice cross-grain fibers. Spur is in line with and in front of the blade. Use for rabbeting with or against grain. (A rabbet plane with a fixed fence is a fillister; one with an adjustable fence is a moving fillister.)



Moving Fillister Plane -- 48-S



Dovetail or Skewed Fillister Plane -- 23-S

Dovetail or Skewed Moving Fillister Plane -- 23-S

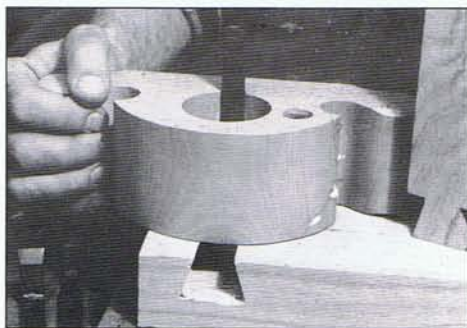
Similar to model 48-S, but with sole and cutter edge angled 10° . The iron is thereby skewed in relation to the fence and body, giving a slicing action when cutting across fibers. Especially suited for molding sloped surfaces and useful for trimming male sliding dovetails.



Rounding Plane -- 51-S

Rounding Plane -- 51-S

Beechwood body 9-1/2 inches long with hornbeam sole. Blade is bedded at 45° . Large rounding planes, sometimes called gutter planes, are useful for scooping long wide coves such as the depression in a wooden settee. Blades are 1-5/16, 1-1/2, or 1-7/8 inches wide.



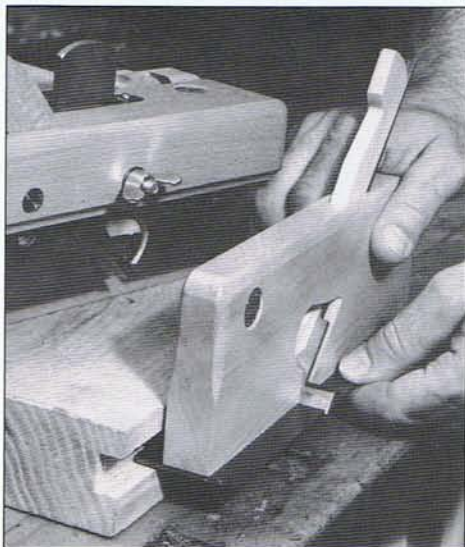
Router Plane -- 20-S

Router Plane -- 20-S

Beechwood router is chunky 9-1/2 inches by 4 inches offering a sure grip for heavy duty routing. Large sole lets you point the cutting edge in any direction. Includes 7/16-, 5/8-, and 13/16-inch wide blades. Heavy gauge blade is held securely in steel collar for chatter free cutting.

Tee Rabbet Plane -- 55-S

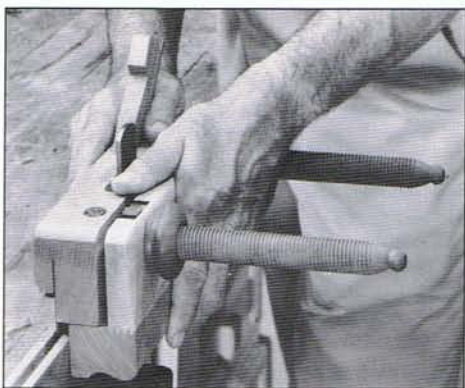
Hornbeam body 9-1/4 inches long with steel sole 1-7/8 inches wide. Blade bedded at 45°. This handy tool enlarges grooves with a T-shaped blade that permits plane to work on grooves that are 5/16-inch or wider. The steel sole extends on both sides so it can trim side of groove from either left or right.



Tee Rabbet Plane -- 55-S

Plow Plane -- 30-S

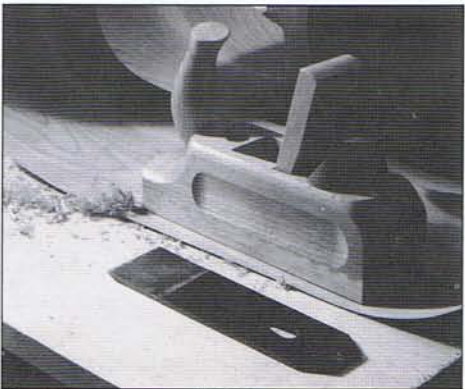
Versatile plane quickly cuts grooves with the grain in either the edge or face of boards for drawer bottoms, door panels, and general casework. The adjustable fence on threaded fruitwood spindles extends the iron up to 5-1/2 inches from an edge. Classic 9-1/2 inch long beechwood plane has a total of six irons: 5/32-, 15/64-, 5/16-, 13/32-, 15/32-, and 35/64-inch.



Plow Plane -- 30-S

Toothing Plane -- 108-S

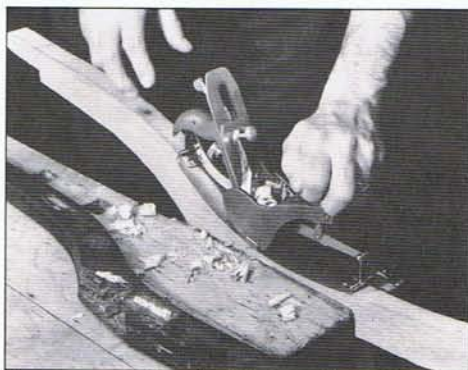
Beechwood body 8-5/8 inches long. Hornbeam sole. Blade 1-7/8 inches wide bedded at 70° angle. Use after jack or try to prepare groundwork for veneering or covering with plastic laminate. Blade has ridges or serrations that striate the surface to provide *tooth* or grip for glue. Plane with the grain. The blade is set at a high angle to minimize tear outs. Therefore, the plane may also be used to flatten or reduce the surface of burl or bird's-eye figured hardwood grain. Follow with scraper or sandpaper.



Toothing Plane -- 108-S

Compass or Circular Plane -- No. 113

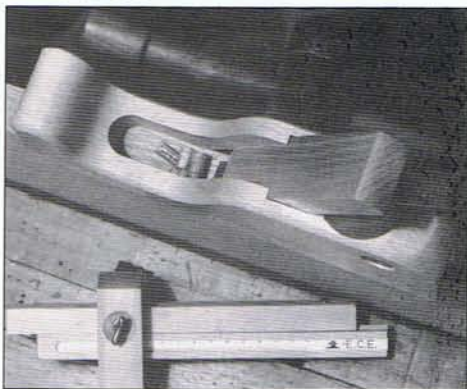
Adjustable sole flexes to smooth convex or concave surfaces. It is a valid concession to an all metal plane.



Compass or Circular Plane -- No. 113

Inletting Plane -- 294-S

Beechwood body 9-1/2 inches long with hornbeam sole. Use this routing plane for hinges, locks, and other shallow mortising cuts with the grain. In use, you view cutting action through the aperture. Cutter is bedded in a groove to assure that it stays square with the sole. Be sure cutter is honed square. To use, scribe the area to be recessed, and outline with a chisel. Begin with shallow cut. Tap cutter deeper after each successive cut. Also use this plane for blind nailing if the grain isn't too difficult. Watching the action



Inletting Plane -- 294-S

through the aperture, raise a 3/4-inch long curl. Then drive in the nail and glue the curl back down over the nail head for an invisible finish.

Spokeshave - No. 51

Balanced hand tool has flat sole and straight iron. Painted handles are raised to clear knuckles.

Spokeshave - No. 55

Concave face and iron. Adjustable iron fixed by thumb screw.

Cabinet Scraper - No. 80

Use for final finishing in place of sandpaper. Slices wood cells rather than abrading them. Also use after toothy plane (108-S) for wild, burl grain.

Caring For Your Plane

Sharpening, adjusting, and touching up scratches

A good plane never needs to be forced. When properly sharpened and adjusted, easy use comes with skill—not force. With practice, a quality plane becomes an extension of your hands and shears the wood with little conscious effort.

To remove Primus plane blade, loosen the depth knob by about one-quarter inch. Then loosen the tensioning screw by four or five turns. Next, push the tensioning rod cross pin out of its seat on the cap iron and turn it 90° so it is free to slip through the slot in the blade. Remove cap iron to sharpen blade. Reverse to reinsert. Caution: in reassembly, be certain the hump on the tensioning rod is up. (See drawings on pages 11 and 13.)

To remove the blade of the Expert plane, turn the locking lever forward and down to release its pressure against the iron. Lift locking mechanism off screws and slip iron out by lifting it off the adjustment peg.

Grinding the plane iron is necessary only if the blade is nicked or chipped or if the secondary bevel becomes too wide or rounded. Otherwise, the primary bevel can be maintained indefinitely by rehoning each bevel, in turn, on a flat stone. Use honing jig for hand sharpening on a six-to-eight-inch long stone.

Use coarse, medium and fine grit india for honing primary bevel. As you move

from coarse to fine grit, honing jig maintains the same angle regardless of the stone thickness. Increase angle and use soft or hard Arkansas for honing the tiny, secondary bevel.

Burrs or nicks in the back iron may hold it away from the cutter permitting chips to wedge between the two irons and foul the cutting action. To correct, smooth that edge of the back iron on a stone so it makes a tight joint.



Adjust back iron as close to edge of cutting iron as the rank of cut or chip thickness permits -- usually 1/32 inch. The purposes of the back iron are two-fold: to give the cutter edge rigidity and to bend chips upward at a steeper angle than would the cutting iron alone. Curling the chips upward against the face of the iron supplements the toe in cracking the shaving at short intervals. This keeps the shaving from increasing in thickness, pulling up, and splintering out.

After the blade has been reinserted, adjust the blade parallel to the sole using the top regulator. To check this adjustment, turn the depth screw in so the

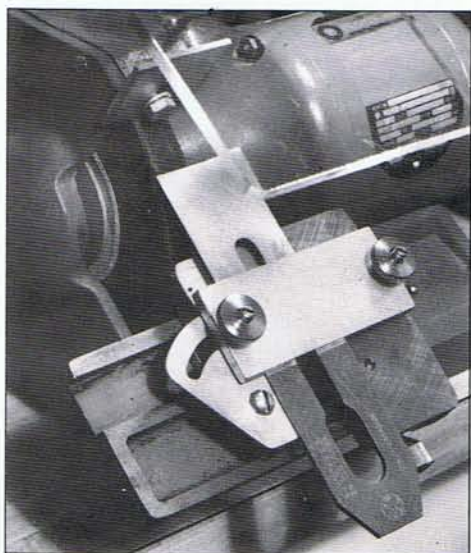
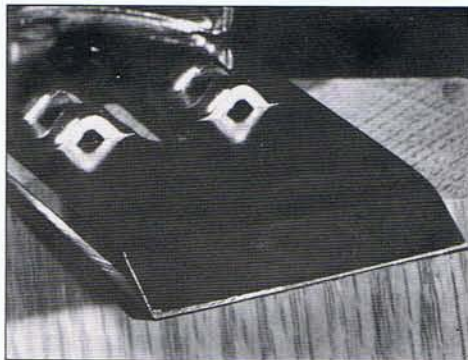
blade protrudes about 1/32-inch. Then sight down the sole against a light to check alignment. When the blade is parallel, back the depth screw out and test for a tissue-thin shaving.

The finish on E.C.E. planes will withstand years of usage. Although it doesn't improve performance, for cosmetic purposes you can touch up scratches and nicks in the varnished plane bodies with a 50/50 solution of boiled linseed oil and white shellac. Use a pad of 4/0 steel wool to rub solution into any marred area. Polish with carnauba wax and soft cloth.

Lignum vitae and hornbeam soles have been selected for their natural oils. Leave all soles unfinished so they may burnish naturally with use. Protect bright metal parts with silicone.

To maintain the cutting edge as long as possible, end each planing stroke by lifting the plane back to the starting point. Do not drag it back. Protect protruding cutting edge. Resting plane on its side when not in use assures the blade will not get nicked on metal or sandpaper crumbs on the bench.

Replacement blades are available for every plane. A spare, pre-sharpened jack and smoothing plane blade allows continuous work. An extra jack and try plane blade can be sharpened differently and reserved for rough work. (See page 25 for replacement blades.)



GRINDING ANGLES

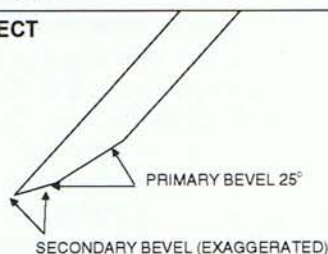
Slight Secondary Bevel Strengthens Cutting Edge

Secondary bevel must be acute to allow back clearance. Back clearance reduces friction. When cutting edge presses down, it compresses the wood. But wood immediately in back of the cutting edge is not compressed. Back clearance provides space for this expansion. Without it, friction heats the cutting edge and dulls it.

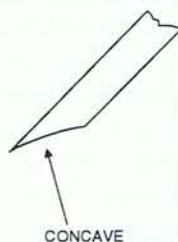
Grinding bevel on small-diameter wheel weakens the edge. A secondary bevel is necessary.

If secondary bevel becomes wide or rounded, back clearance is lost. Rounded bevel prevents cutting edge from biting in. Blade heats up and it dulls further.

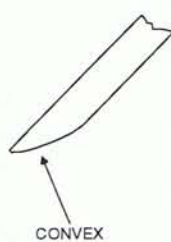
CORRECT



INCORRECT



INCORRECT



**APPLICATION
EDGE***

**SHAPE OF
OBJECTIVE**

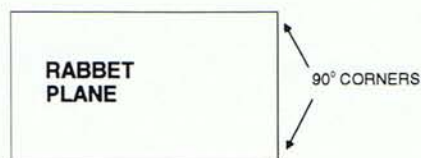
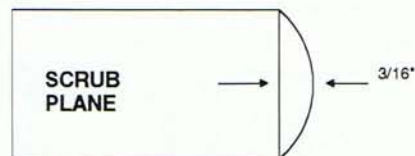
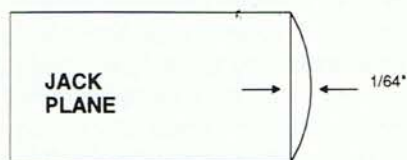
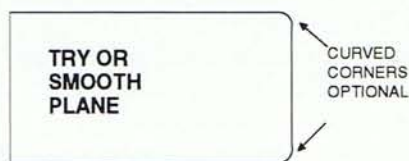
Slightly rounded corners eliminates cutting hard lines at blade edges assuring a smooth surface.

A slightly curved edge speeds wood removal. Especially applicable on blades reserved for cleaning up rough sawn lumber, and other heavy duty applications.

Blades ground with pronounced curve permit rapid removal of waste wood. The primary angle may be ground at 30° or even 35° to strengthen edge.

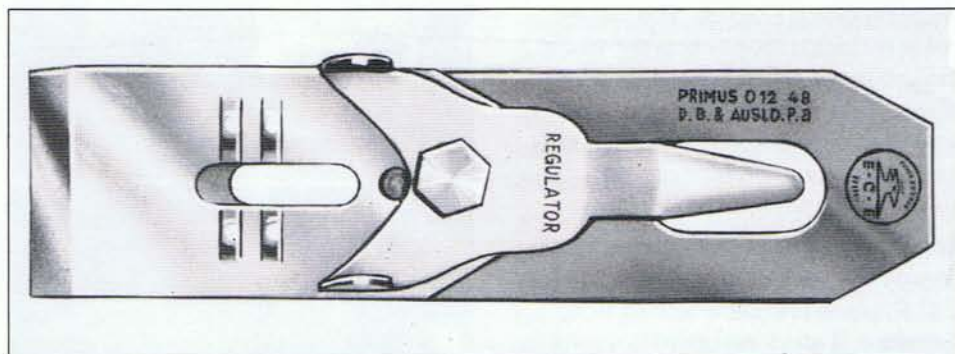
Grind and hone Rabbet plane iron perfectly square with sharp corners.

****Edge curves are exaggerated to illustrate concept.***



Replacement Blades

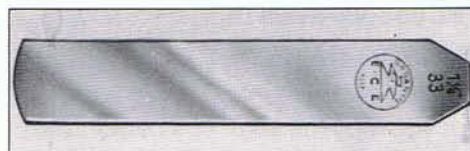
Keeping a spare blade for each plane is wise. It allows the project to continue unimpeded.



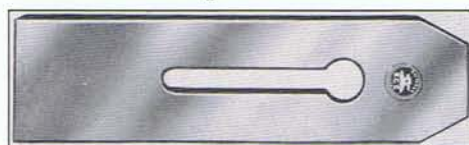
12-K Primus double plane iron with regulator - 48mm and 60mm. A red coated plane blade (No. 12-R) hardened to Rockwell C-65 is also available for all Primus planes. Use it for trimming plastic laminate.



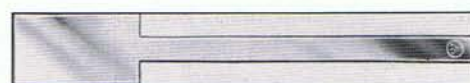
12 Primus plane iron only - 48mm and 60mm.



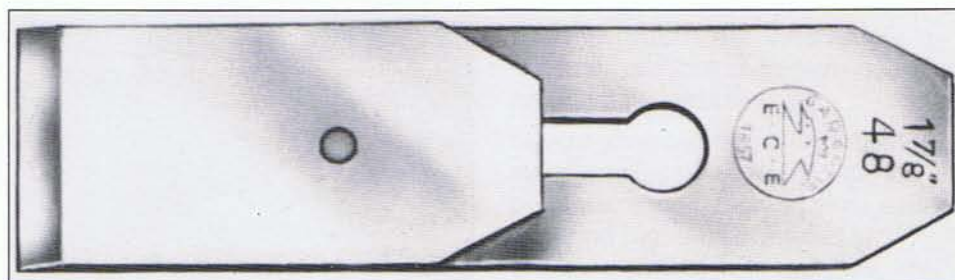
1606 Scrub plane iron, curved edge - 33mm.



1602 Wedged plane iron - 48mm.



1608 Rabbet plane iron for Nos. 9-S and 58-S - 30mm.



1612 Double plane iron for Wedged Plane - 48mm.

Accessories for Bench Planes

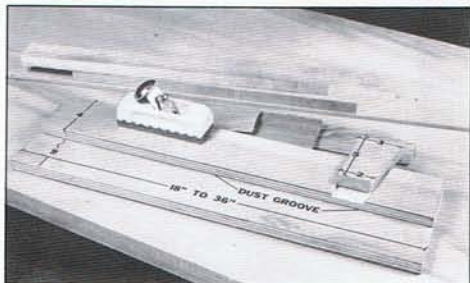
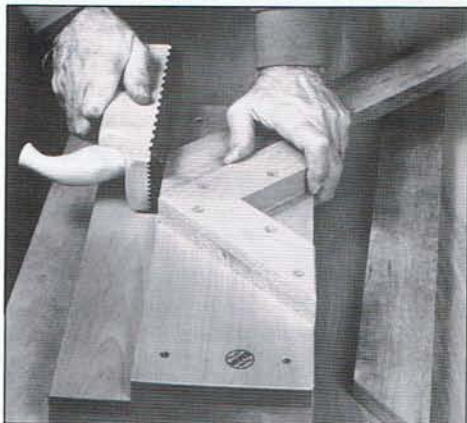
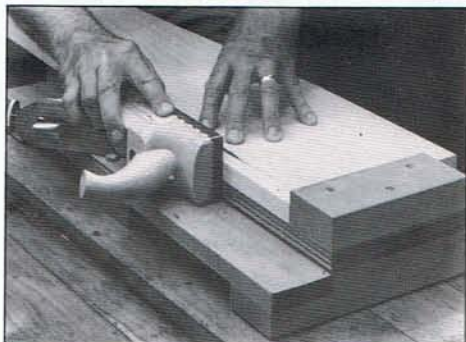
Shooting clamps and boards help square-up stock

Heavy-duty accessory, useful for planing end grain, is this square-and-miter-shooting clamp (226-S). The clamp holds molding pieces securely, while the jaw faces act as a base for a jack plane. Such a base gives you good control to pare end grain. Note: heavy paper cemented on face protects clamp. Jaws open to 5-1/4 inches.

At right are straight- and miter-shooting boards with jack planes. The sole of an E.C.E. plane is square with its side, therefore, a shooting board is useful for trimming edges or miters. Shooting boards are especially handy for squaring edges of thin, wobbly stock. Boards can be shop-made using dry woods.

EASY TO MAKE

Easy to make shooting board is handy for squaring the edge of a board. Use plane on its side and push along the wood fence. Work piece is placed against a stop and on top of the fence. The plane slices edge of the stock over-hanging the fence and planes it perfectly square. The tapered stop fits in a tapered dado to wedge in place. Lower edge of fence is chamfered to create a dust groove.

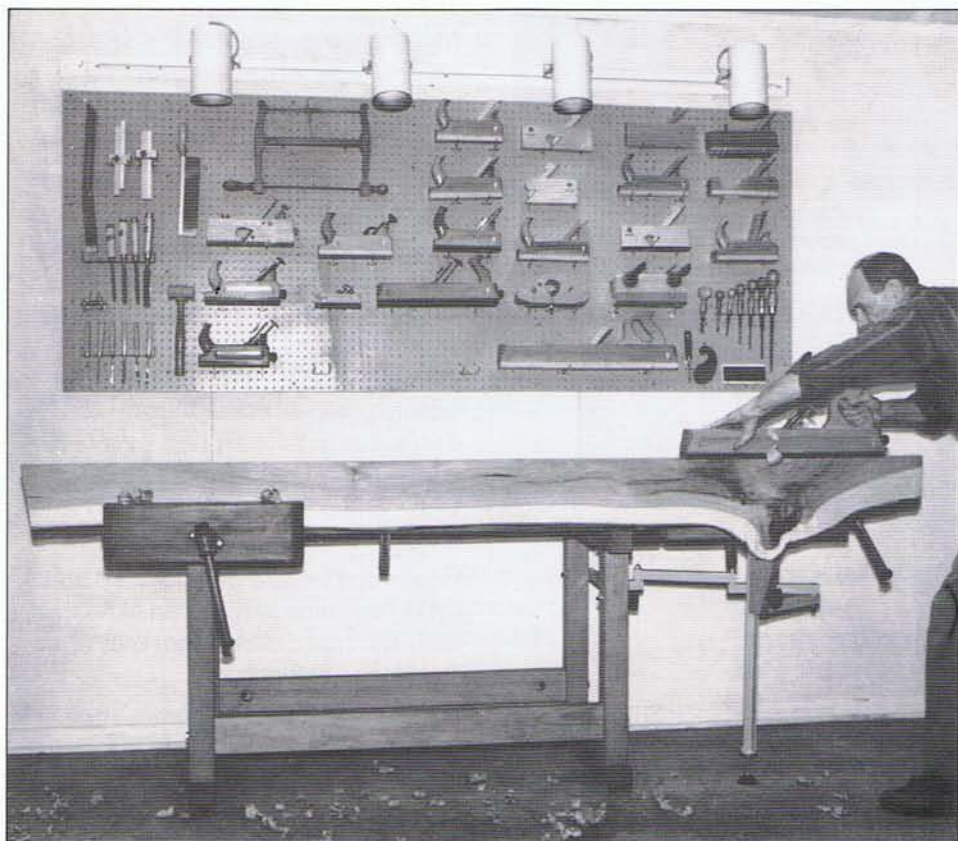


Bench Support

A workbench is the centerpiece of every shop. An adjustable work support enhances the workbench. It adds versatility and convenience. It allows fashioning large pieces of stock that otherwise would be unwieldy, if not impossible to handle on stationary power tools.

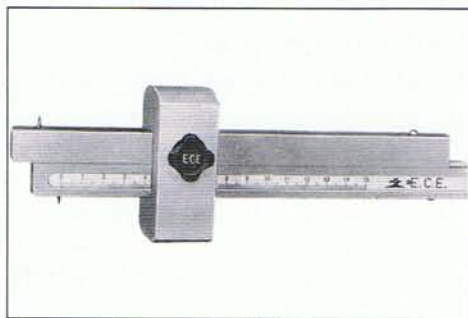
Holding work-in-process is the function of a workbench. The E.C.E. support system is carefully designed to provide the broad-based support needed to plane various large pieces.

Attach the E.C.E adjustable support to the bench trestle below the tail stock. It will support stock over the entire length of the bench.



Marking Tools

E.C.E. offers a variety of high-quality, precision marking tools. They include try squares, adjustable bevels, and marking gauges.



Marking Gauge -- No. 217-S

Marking Gauges

Marking gauges are indispensable in cabinet making layout. E.C.E.'s precision hornbeam marking gauges have two individually adjustable posts with corresponding, easy to read scales. Dimensions are shown in black on white plastic in either metric or inches. Dual posts save time making adjustments for dual scribes, common in marking cuts for rabbet, plow, and mortise and tenon joints. And, the dual posts provide a firmer grip.

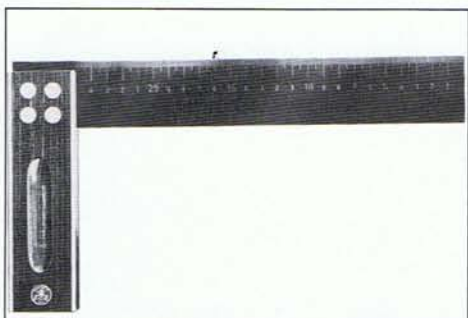
Marking gauge No. 217-P is especially attractive. Its white hornbeam plate sports a thin, contrasting lignum vitae facing using E.C.E.'s castellated glue joint.

Try Squares

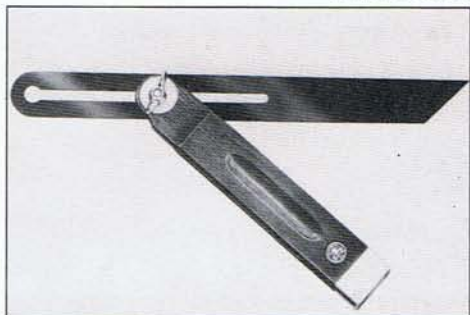
Whether it's to test surfaces for flatness, check squareness of adjacent surfaces, or mark lines across the face or edge of stock, squares are used throughout a project. It is vital that a square retain its squareness. Emmerich uses four brass pins at the corner to assure that rough handling won't jar the 90 degree angle of handle and blade.

Rosewood handle with polished brass facing combine to make an attractive tool. The blued steel beam with white markings are functional.

Beams are 150mm, 250mm, and 350mm.



Try Square -- No. 409



Adjustable Bevel -- No. 411

Adjustable bevel - No. 411

Just as a try square needs to stay at 90 degrees, an adjustable bevel needs to hold a desired angle. The E.C.E. design does that. Heavy brass washers and long slit in the handle unite with the thumb screw to fuse the handle and blade to any angle up to 180 degrees.

Chisels -- No. 500

Chisels are frequently needed to clean ends of cuts made by specialty planes. The same high quality steel and select hornbeam wood are used in E.C.E. firmer chisels. The nicely balanced tools are available in 14 different blade widths. (See price list.)

Mallets

E.C.E. offers mallets in several diameter heads from appropriate woods.

Carpenter's Mallet - No. 213-S

140mm head made of varnished, steamed beech with a shaped, varnished ash handle wedged and glued into head.

Carver's Mallet - No. 212-P

Lignum vitae head, 100mm diameter, ash handle.

Carver's Mallet - No. 212-S

Steamed beech head, 110mm diameter, ash handle.

Round Head Mallet - No. 214

70mm turned head of hornbeam with varnished ash handle.

Miter saws

Slitting backsaws with beech handles round out E.C. Emmerich hand tools.

No. 205 - Fine cutting - 250mm.

No. 206 - Back saw with steel back - 350mm.

Man is a tool using animal.
Without tools he is nothing,
with tools he is all.

Thomas Carlyle

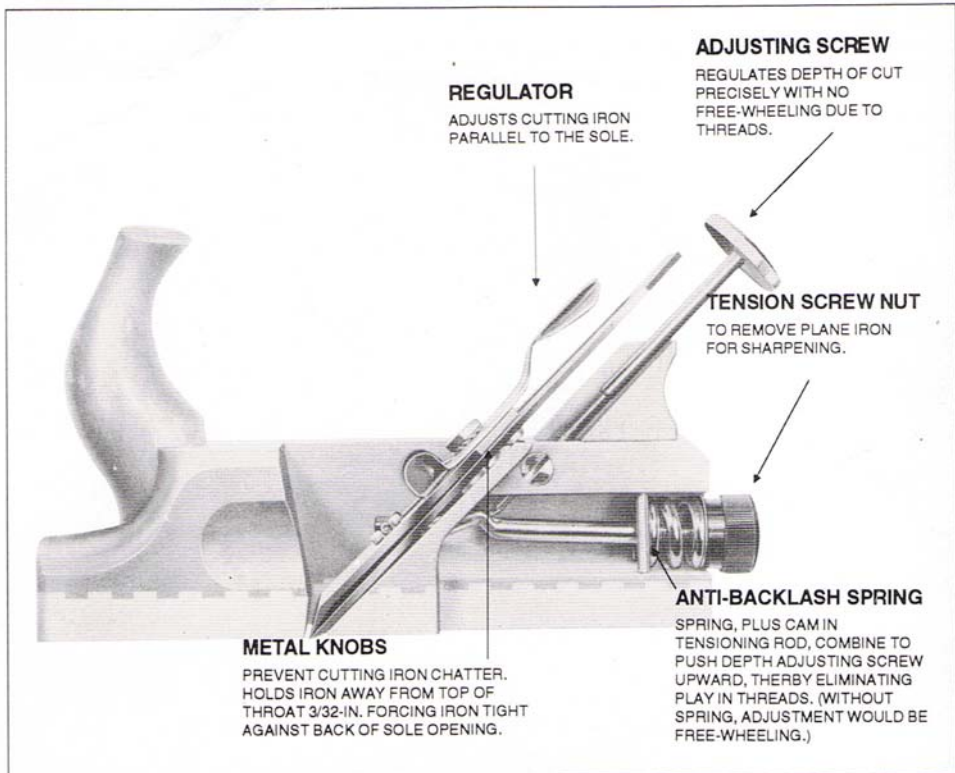
Until the 19th century all furniture was crafted using only hand tools. Today, use power tools to do the grunt work. Then, use hand tools to complete your fine woodwork. It is the later stages of crafting that planes, back saws, and chisels are still required.

Hand tools are indispensable.
Often you must bring the tool to the workpiece,
not the workpiece to the tool.





E.C.E. tools are carefully inspected before shipping. Planes are sharpened ready to use out of the box.



Wood with properties ideally suited to plane manufacturer are quater-sawn and scientifically cured. Plane bodies are joined to soles with a glue joint cut with laser-like accuracy and fitted under high pressure. The ultramodern PRIMUS precision adjustment shown completes the state-of-art plane.



APPLYING THE SCIENCE OF PLANE MANUFACTURING SINCE 1852

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